

WHAT IS CLAIMED IS:

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92 of 97
313/504+
Opposed to 3,602,000

1. A conductive organic compound device,
comprising: a pair of oppositely spaced electrodes,
and a carrier transporting layer disposed between the
electrodes and in contact with one of the electrodes;
wherein the carrier transporting layer comprises a
conductive organic compound having a π -electron
resonance structure in its molecule, and the π -
electron resonance structure plane of the conductive
10 organic compound in the carrier transporting layer is
aligned substantially parallel to surfaces of the
electrodes.

2. A conductive liquid crystal device,
15 comprising: a pair of oppositely spaced electrodes,
and a carrier transporting layer disposed between the
electrodes and in contact with one of the electrodes;
wherein the carrier transporting layer comprises a
conductive liquid crystal having a π -electron
20 resonance structure in its molecule, and the π -
electron resonance structure plane of the conductive
liquid crystal in the carrier transporting layer is
aligned substantially parallel to surfaces of the
electrodes.

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3. An organic electroluminescence device,
comprising: a pair of oppositely spaced electrodes,

*Subject
Cont'd*

and a carrier transporting layer and a luminescent organic layer disposed in lamination between the electrodes so that the carrier transporting layer is disposed in contact with one of the electrodes;

5 wherein the carrier transporting layer comprises a conductive liquid crystal having a π -electron resonance structure in its molecule, and the π -electron resonance structure plane of the conductive liquid crystal in the carrier transporting layer is

10 aligned substantially parallel to surfaces of the electrodes.

4. An electroluminescence device according to Claim 3, wherein the luminescent organic layer and the carrier transporting layer comprising a conductive liquid crystal have been formed by vacuum deposition.

5. An electroluminescence device according to Claim 3, wherein the substantially parallel alignment 20 of the π -electron structure plane of the conductive liquid crystal in the carrier transporting layer has been achieved by a heat treatment of the device.

6. An electroluminescence device according to 25 Claim 4, wherein the luminescent organic layer is in an amorphous state.

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7. An electroluminescence device according to any one of Claims 3 to 6, wherein the conductive liquid crystal is a discotic liquid crystal.

5 8. An electroluminescence device according to Claim 7, wherein the conductive liquid crystal is in a discotic disordered phase or a liquid crystal phase having a lower order than the discotic disordered phase.

10 9. An electroluminescence device according to any one of Claims 3 - 6, wherein the conductive liquid crystal is a smectic liquid crystal.

15 10. A electroluminescence device according to Claim 9, wherein the conductive liquid crystal is in a smectic E phase or a liquid crystal phase having a lower order than the smectic E phase.

20 11. A conductive liquid crystal device, comprising: a pair of oppositely spaced electrodes, and at least one conductive liquid crystal layer formed by vacuum deposition of a conductive liquid crystal and assuming a liquid crystal state and an 25 amorphous layer formed by vacuum deposition of a conductive organic compound and contacting the conductive liquid crystal layer, respectively disposed

Substrates
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Substrates
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between the substrates.

12. An organic electroluminescence device, comprising: a pair of oppositely spaced electrodes, 5 and at least one conductive liquid crystal layer formed by vacuum deposition of a conductive liquid crystal and assuming a liquid crystal state and an amorphous layer formed by vacuum deposition of a conductive organic compound and contacting the 10 conductive liquid crystal layer, respectively disposed between the substrates; wherein either one of the conductive liquid crystal layer and the amorphous layer is a luminescence layer.

15 13. An electroluminescence device according to Claim 12, wherein the conductive liquid crystal is a discotic liquid crystal in a discotic columnar phase.

discotic column
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20 14. An electroluminescence device according to Claim 12, wherein the conductive liquid crystal is a smectic liquid crystal in a smectic phase.

smectic